

REMARKS*Claim Amendments*

Applicants respectfully request entry of the above claim amendments, which cancel Claims 5, 22 and 51, amend Claims 1-3, 6, 7, 18, 24, 44-47 and 52, and add new Claims 68-90. Support for the amendments is found at Page 3, line 10 through Page 4, line 3, and in Example 2 (Pages 24-25) and Fig. 6 of the PCT Application as published, among other places. The new Claims 68-90 correspond to Claims 19-21, 23, and 25-43 that were previously canceled and are here being re-introduced.

Rejections under 35 U.S.C. §102(b) and 35 U.S.C. §103(a)

Claims 1-4 and 63-67 were rejected under 35 U.S.C. §102(b) as anticipated by U.S. Patent No. 5,348,691 of McElroy *et al.* (here “McElroy *et al.* ’691”). Claims 5-18, 22, 24 and 44-62 were rejected as obvious over various combinations of McElroy *et al.* ’691, International Patent Application WO 00/44479 (here “Cheng *et al.* ’479”) and U.S. Patent No. 4,704,348 of Koizumi *et al.* (here “Koizumi *et al.* ’348”).

Applicants respectfully traverse these rejections and submit that none of independent Claims 1, 7, 18, 24 and 44-47 is disclosed or suggested by any of McElroy *et al.* ’691, Cheng *et al.* ’479 or Koizumi *et al.* ’348, separately or in combination, because those references do not disclose or suggest use of a hollow fiber membrane moisturizer that is configured to add moisture to a purge gas by including a mass flow controller to control flow rate of the purge gas through the hollow fiber moisturizer and a pressure regulator to control flow of the water through the hollow fiber moisturizer such that the moisture is added to the purge gas.

In particular, McElroy *et al.* ’691 does not disclose or suggest such a feature recited in each of the independent claims because McElroy *et al.* ’691 relates to membrane sheet humidifiers (see 16a in Fig. 1 of that reference) rather than to use of a hollow fiber membrane moisturizer as recited in the present claims. Further, McElroy *et al.* ’691 does not disclose or suggest use of a mass flow controller to control flow rate of a purge gas through a hollow fiber moisturizer and a pressure regulator to control flow of water through a hollow fiber moisturizer such that moisture is added to the purge gas.

Further, Cheng *et al.* '479 does not disclose or suggest the independent claims because one of ordinary skill in the art would have been taught away from the claimed hollow fiber membrane contactor configured to add moisture to a purge gas by the contents of Cheng *et al.* '479 itself. Cheng *et al.* '479 describes applications of liquid-gas contactors for gas absorption and gas stripping.

In such conventional applications of liquid-gas contactors, gas absorption from a gas stream was accomplished by dispersing the gas as bubbles in packed towers and plate columns in a counter-current flow to the liquid stream. The goal of the liquid-gas contactor was to add the gas into a liquid.

The other conventional use of a liquid-gas contactor discussed in Cheng *et al.* '479 involved gas stripping, in which a gas dissolved in a liquid was transferred out of the liquid into a gas stream.

Cheng *et al.* '479 discusses the use of membrane contactors to perform these two functions of conventional liquid-gas contactors, *i.e.*, gas absorption and gas stripping. (See Page 2, lines 4-15 of Cheng *et al.* '479). Gas transfer occurred across the pores of a membrane contactor, either to add or to remove gas from a liquid. For example, oxygen was removed from ultra-pure water.

However, Cheng *et al.* '479 does not disclose or suggest a hollow fiber membrane moisturizer that is “configured to add moisture to a purge gas,” as recited by each of the independent claims, *i.e.*, a membrane configured to add liquid to a gas, which is the reverse of the Cheng *et al.* '479 process.

Page 3, lines 12-16 of Cheng *et al.* '479, for example, discuss application of a polymeric membrane for use with organic solvent-based solutions for wafer coating in the microelectronics industry, and for high-temperature stripping baths in the same industry. At Page 5, lines 1-4 of Cheng *et al.* '479, typical applications for a membrane contactor are described as removing dissolved gases from liquids (“degassing”) or adding a gaseous substance to a liquid, such as adding ozone to very pure water to wash semiconductor wafers. At Page 6, lines 12-18 of Cheng *et al.* '479, the addition of ozone to drinking water is discussed; and at Page 6, line 19 through Page 7, line 3 of Cheng *et al.* '479, there is discussed the cleaning of organic impurities from silicon wafers at room temperature with ozone-injected ultrapure water.

However, these applications of hollow fiber membrane contactors discussed in Cheng *et al.* '479 would have led one of ordinary skill in the art to consider that such membrane contactors could be used for gas absorption from a liquid, gas stripping from a liquid, adding a gas to a liquid, or performing a chemical reaction. All of those applications are focused on the liquid, either to add or remove gas from it.

By focusing on degassing or adding gas to a liquid, none of these applications discussed in Cheng *et al.* '479 disclose or suggest the humidification of a gas by adding a liquid such as water to the gas across a hollow fiber membrane contactor. Cheng *et al.* '479 therefore would have taught away from the creative idea of a hollow fiber membrane moisturizer that is "configured to add moisture to a purge gas," as recited by each of the independent claims. In addition, by teaching away from using a hollow fiber membrane moisturizer to add moisture to a purge gas, Cheng *et al.* '479 likewise does not disclose or suggest use of a mass flow controller to control flow rate of the purge gas through the hollow fiber moisturizer and a pressure regulator to control flow of the water through the hollow fiber moisturizer such that moisture is added to the purge gas, as recited in each of the independent claims.

Applicants therefore submit that Cheng *et al.* '479 does not disclose or suggest the recited features of the independent claims.

In addition, Koizumi *et al.* '348 does not disclose or suggest the features recited in the independent claims because Koizumi *et al.* '348 relates to use of a humidifier 16 (see Fig. 3 of Koizumi *et al.* '348) in which a layer of porous glass 24 separates nitrogen gas from de-ionized water 27, such that gas inlet through inlet pipe 25 bubbles through the water 27 to produce a humidified stream that is fed into outlet pipe 26. Koizumi *et al.* '348 therefore does not disclose or suggest use of a hollow fiber membrane moisturizer that is configured to add moisture to a purge gas. Further, Koizumi *et al.* '348 does not disclose or suggest a hollow fiber membrane that is configured to add moisture to a purge gas by including a mass flow controller to control flow rate of the purge gas through the hollow fiber moisturizer and a pressure regulator to control flow of the water through the hollow fiber moisturizer such that the moisture is added to the purge gas. Koizumi *et al.* '348 therefore does not disclose or suggest the features recited in the independent claims.

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Further, the combination of any of McElroy *et al.* '691, Cheng *et al.* '479 and Koizumi *et al.* '348 likewise does not disclose or suggest the independent claims because none of those references separately or in combination discloses or suggests the foregoing features.

Applicants therefore submit that independent Claims 1, 7, 18, 24 and 44-47 are not disclosed or suggested by any of McElroy *et al.* '691, Cheng *et al.* '479 and Koizumi *et al.* '348, separately or in combination. Because the other rejected claims are dependent on the independent claims, they include their features and are therefore likewise not disclosed or suggested for the same reasons. Applicants therefore request reconsideration and allowance of all claims.

Supplemental Information Disclosure Statement

A Supplemental Information Disclosure Statement (SIDS) is being filed concurrently herewith. Entry of the SIDS is respectfully requested.

CONCLUSION

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

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